

AMENDMENTS TO THE SPECIFICATION

Please amend the paragraph beginning on line 6 of column 1 as follows:

This is a continuation of U.S. reissue application Ser. No. 09/016,777, filed January 30, 1998, now U.S. Pat. No. RE37,342, which is a reissue of U.S. Ser. No. 08/396,574, filed March 1, 1995, now U.S. Pat. No. 5,488,433 [(Pat. No. 5,488,433)], which is a continuation-in-part of U.S. application Ser. No. 08/298,104, filed Aug. 30, 1994, now U.S. Pat. No. 5,537,157, and U.S. application Ser. No. 08/050,861, filed Apr. 21, 1993, now U.S. Pat. No. 5,450,140, the entire contents of all of the above-identified patent applications and resulting issued patents [which] are incorporated herein by reference.

Please replace the paragraph beginning on line 20 of column 1 with the following paragraph:

Traditional video editing systems are generally divided into two categories: linear and non-linear. Linear editing systems are generally integrated with tape-based program storage, while non-linear editing systems are associated more closely with disk-based storage media, wherein random-access storage more easily may be implemented. The typical linear editing system is implemented with one of the many "broadcast quality" videotape recording formats. The choices for analog recorders include, among others, 1" C-format, Betacam, Betacam-SP, 3/4" U-matic, U-matic-SP, S-VHS, and Hi-8. The choices for digital recorders include, among others, D-1, D-2, D-3, D-5, DCT, and Digital Betacam. Each of these recording formats is incompatible with any other format, and all require sophisticated system facilities, including synchronization systems, edit controllers, audio and video switchers and processors, digital video effects (DVE) systems, character generators, and other equipment. This, in turn, requires

extensive physical plant facilities for electric power, air conditioning and air filtration, storage space, and maintenance equipment. Furthermore, large operational and maintenance staffs are required to keep the equipment in good working order. However, recording duration capacity for these types of videotape recorders ranges up to three hours or more, making them uniquely valuable for many applications, such as program distribution, archival storage, and as master program sources for mass duplication of videos for the home video market.

Please replace the paragraph beginning on line 52 of column 2 with the following paragraph:

A method of producing a final video program according to the invention therefore includes the steps of providing program source materials in first and second digital formats, the first format being characterized in having a higher data compression ratio than the second; recording the materials in the first and second formats, respectively, onto first and second removable storage media along with correlated edit-time-code information in each case; interfacing the first storage medium to an off-line video editing system to develop an edit decision list; interfacing the second storage medium to an on-line video editing system; transferring the edit decision list developed in conjunction with the off-line video editing system to the on-line video editing system; and editing the materials in the second format on the second storage medium, in accordance with the edit decision list, to produce a final video program.

Please replace the paragraph beginning on line 57 of column 4 with the following paragraph:

While a software-based implementation of the data compression is possible, a hardware-based implementation is preferred, with the system employing, for the tape-based drives, a data-compression ratio of 5:1 for conventional signals (NTSC/PAL) and a 10:1 data-compression ratio for HDTV signals. For the hard-disk drive, a data-compression ratio of 50:1 is preferably utilized. Examples of the many available options for this data compression function include the currently available Apple QuickTime system, fractal compression, MPEG-1 (for off-line applications) and Motion-JPEG (for on-line applications). In many applications, MPEG-2 data compression will be suitable for on-line editing. Audio signals may be included within the data stream, as proposed in the several systems for digital television transmission already under evaluation by the Federal Communications Commission, or by one of the methods available for integrating audio and video signals used in multi-media recording schemes, such as the Microsoft ".AVI" (Audio/Video Interleave) file format. As an alternative, an independent system for recording audio signals may be implemented, either by employing separate digital recording provisions controlled by the same system and electronics, or by implementing completely separate equipment external to the camera system described above.

Please replace the paragraph beginning on line 27 of column 5 with the following paragraph:

As an optional feature, a PCMCIA expansion adapter 106 may be provided, so that a plurality of PCMCIA cards or PCMCIA devices 108 may be accessed conveniently through a single PCMCIA slot on the PC, as shown. This expansion adapter is provided with internal selection and multiplexing circuitry, so that each plug-in card or device may be accessed independently and without interference with any other card or device in the expansion adapter.

The selection may be performed by employing techniques well-known in the art, such as the addressing schemes utilized for SCSI or GPIB data busses. Since a single 420 MByte PCMCIA card module is capable of holding 75 minutes of programming material with image dimensions in pixels of 320×240, 4:2:2 sampling and a 50:1 data compression ratio, an expansion adapter equipped with ten PCMCIA slots and plug-in cards is capable of providing ten hours of original program material, and this programming capacity is capable of being further expanded with other types of PCMCIA-compatible devices. As a further option, a custom-designed PC could be provided with multiple PCMCIA slots to accept a plurality of storage devices without the need for an external expansion adapter.

Please replace the paragraph beginning on line 21 of column 6 with the following paragraph:

In addition, it is common practice in broadcast-television news studios to use remotely controlled cameras to telecast the live programs. These cameras are mounted on motorized bases which are capable of moving the cameras to any desired position on the stage, within the physical limits imposed by the stage itself (such as the length of the camera cables or the clearance available for cameras to move relative to each other on the stage). The zoom-lenses, pan-tilt mounts, and camera electronic control settings are manipulated through the camera remote-control facilities, which may include either separate electronic control panels or alternatively computer interfaces with appropriate control software, such as the unit described by Washino, U.S. Pat. No. 5,325,202. By coupling the software script materials to instructions for control of the camera movements, the capabilities of all of these systems may be optimized. The

modified script file must be prepared before the actual taping occurs, however, and should include the physical layout of the sets and props for each scene.

Please replace the paragraph beginning on line 40 of column 6 with the following paragraph:

The staging information described herein above, is identified by special camera-remote-control software, and the camera control operator is provided with a graphical interface which depicts the layout of the set and the “blocked” positions of the actors and props for a given scene. This system preferably also includes a user interface (such as a touch-screen or a mouse) to enable the camera control operator to program the cameras to be in the correct location, and to have the correct zoom-lens and pan-tilt positions, to capture the scene as desired, as described in co-pending application U.S. Ser. No. 08/050,861. At this time, the operator optionally may add information to control automated lighting systems, which are well-known in the art of the film, video, and stage production. This enhanced version of the modified script file is then used to direct camera actions during the actual taping of the scenes, and is further modified as part of the off-line editing process as the EDL is developed, as described above, in accordance with the invention.

Please replace the paragraph beginning on line 32 of column 7 with the following paragraph:

The invention may be used for other applications limited to record/playback, without implementing the full range of editing features. For example, in applications such as master playback for video duplication, the program master tape must be played, rewound to the

beginning, and then restarted, on a repeating cycle. In facilities employing a conventional video tape recorder, this represents a great deal of physical stress on the program master tape, thereby requiring a large number of copies of this master tape when many production runs are required to complete an order. In addition, some production time is lost due to the rewinding process itself. In a disk-based application of the system disclosed herein, there is no significant deterioration of the master program even in repeated usage, and it is possible to begin playing a program at any point desired, with essentially no delay due no cueing the program media to the physical location containing that part of the recorded program. In order to provide the necessary recording time duration, additional hard-disk drives would be added to achieve the required playback duration. Based on an MPEG-2 data-compression ratio of 20:1 (with a 4:2:2 recording system for NTSC signals), two hours of digital video would require approximately 8 GB of disk storage capacity. Disk-drives offering capacity of 9 GB are currently available, and until removable media achieve comparable levels, a program would accordingly be loaded into internal or external disk-storage units from the required number of removable media units.